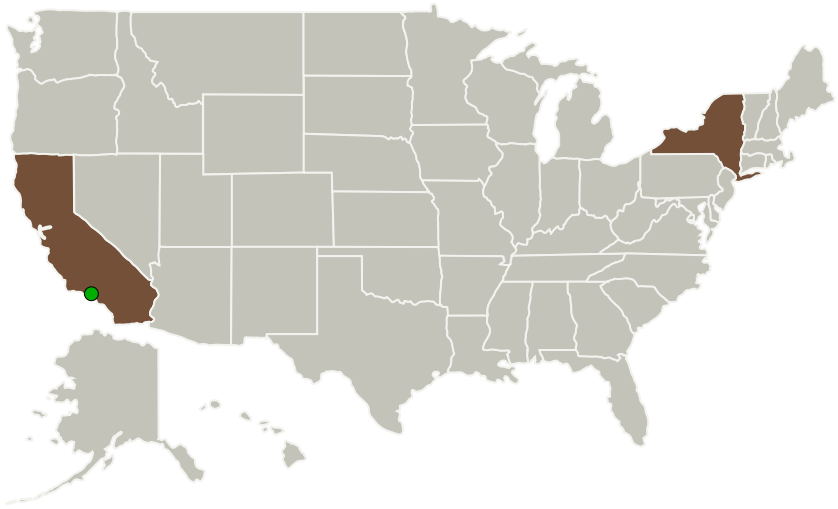
High Temperature Venus Drill and Sample Delivery System, Phase I

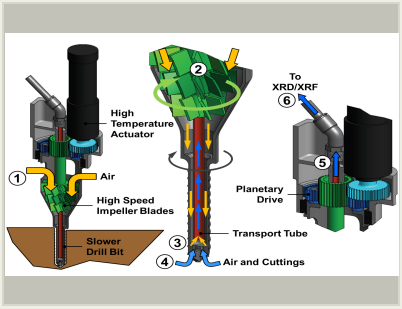
Completed Technology Project (2014 - 2014)

Project Introduction

We proposed to design, build and test a high temperature Pneumatic Drill and Trencher system for Venus subsurface exploration. The Venus Drill and Trencher will be hybrid systems capable of acquiring surface and subsurface regolith as well as pulverized rocks (i.e. cuttings) from depth (the exact depth will be driven by the science requirement). The drill and the trencher unique sample delivery system will be able to transfer samples as they are being acquired, directly into the science instruments. Hence, these systems could be a single deployment system – it will have to drill/cut down once to deliver samples, and never retract. If the Venus Drill and/or Trencher will be deployed from a robotic arm, the system could be used multiple times. If the Venus Drill or the Trencher will be body mounted or mounted to a single degree of freedom system (spring deployable single action arm), it would be deployed once. Depending on the deployment requirements, the Drill and the Trencher could require just one actuator, while the remaining degrees of freedom (lowering the system to the ground and/or deploying the system some distance from the lander) could be achieved by a set of springs and hinges.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Honeybee Robotics, Ltd.	Lead Organization	Industry	Pasadena, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	New York

Project Transitions

June 2014: Project Start

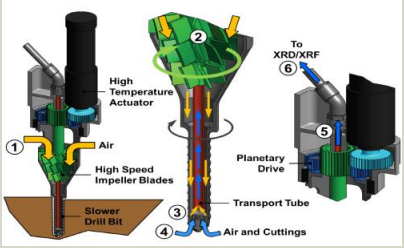
December 2014: Closed out

Closeout Summary: High Temperature Venus Drill and Sample Delivery Syste m, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/140605)*

Images



Briefing Chart Image
High Temperature Venus Drill and Sample Delivery System, Phase I *(https://techport.nasa.gov/image/130595)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Honeybee Robotics, Ltd.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Kris Zacny

Co-Investigator:
Kris Zacny

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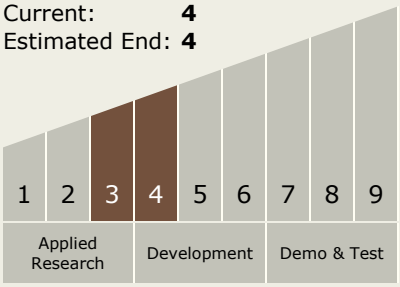
Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.2 Mobility
    - TX04.2.4 Surface Mobility

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System